EXHIBIT E

Reissue Application
081553.0102

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reissue of: **U.S. PATENT NO. RE41,428**	§	First Named Inventor: **PAVEL MAYER**
Issued.: **JULY 13, 2010**	§	Application No.: To be assigned
Filed: **DECEMBER 31, 2007**	§	Atty. Docket No: **081553.0102**
Title: **"METHOD AND DEVICE FOR PICTORIAL REPRESENTATION OF SPACE-RELATED DATA"**	§	

MAIL STOP REISSUE
Commissioner for Patents
P.O. Box 1450
Alexandria, Va 22313-1450

CERTIFICATE OF FILING ELECTRONICALLY VIA EFS
37 C.F.R. § 1.8

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DATE OF SUBMISSION: **FEBRUARY 21, 2013**
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PRELIMINARY AMENDMENT

Dear Honorable Commissioner:

Please amend the above-identified reissue application as follows:

- **Amendments to the Specification** begin on page 2 of this paper;
- **Amendments to the Claims** begin on page 12 of this paper; and
- **Statement of Status and Support for All Changes Under 37 C.F.R. 1.173(c)** begins on page 21 of this paper.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	METHOD AND DEVICE FOR PICTORIAL REPRESENTATION OF SPACE-RELATED DATA
First Named Inventor/Applicant Name:	Pavel Mayer
Filer:	Elizabeth L. Durham/Nicci Fowler
Attorney Docket Number:	081553.0102

Filed as Small Entity

Reissue (Utility) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility Reissue Basic	2014	1	195	195
Design and utility Reissue Basic	2114	1	310	310
Design and utility Reissue Basic	2314	1	380	380
Pages:				
Claims:				
Reissue claims in excess of 20 for small	2205	43	31	1333
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	2218

Electronic Acknowledgement Receipt

EFS ID:	15020194
Application Number:	13773341
International Application Number:	
Confirmation Number:	1036
Title of Invention:	METHOD AND DEVICE FOR PICTORIAL REPRESENTATION OF SPACE-RELATED DATA
First Named Inventor/Applicant Name:	Pavel Mayer
Customer Number:	23640
Filer:	Elizabeth L. Durham/Nicci Fowler
Filer Authorized By:	Elizabeth L. Durham
Attorney Docket Number:	081553.0102
Receipt Date:	21-FEB-2013
Filing Date:	
Time Stamp:	18:14:46
Application Type:	Reissue (Utility)

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Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$2218
RAM confirmation Number	5678
Deposit Account	020384
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Reissue Application	Transmittal.pdf	51283 15f2904b7a7ec09cf3590516371df60f6c737f0a	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	Fees-Transmittal-Final.pdf	534462 d6548ffab21c1c136be49e3313e5ac3343d15b25	no	2
Warnings:					
Information:					
3		Printed-Patent-USRE41428.pdf	1088596 98c76b42e612277a35e6ec2b31ea7b1c2c632106	yes	19

Multipart Description/PDF files in .zip description

Document Description	Start	End
Abstract	1	2
Drawings-only black and white line drawings	3	13
Specification	14	17
Claims	18	19

Warnings:					
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4	Reissue dec filed in accordance with MPEP 1414	DECL-OF-ASSIGNEE.pdf	1419914 00cfc64891744450f977b1b20a3cb6f1d347889c	no	4
Warnings:					
Information:					
5	Application Data Sheet	ADS.pdf	51253 d6d7a9b42909846a842d52e11afad8fe471cdcf7	no	7
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6		Consent-of-Assignee-and-373.pdf	2584246 b8a7f2a559ed6faf4a1a20c7a0a79e1f5c0b2090	yes	4

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Consent of Assignee accompanying the declaration	1	1
Assignee showing of ownership per 37 CFR 3.73.	2	4

Warnings:

Information:

7	Assignee showing of ownership per 37 CFR 3.73.	ASSIGNMENT.PDF	428618 e967e9869245a058fcf2d9ea25b26c4f47df41cc	no	8

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8	Power of Attorney	POA.pdf	764424 7e76771ddfce48cfb788bf7ade7cc61d203dd9e3	no	1

Warnings:

Information:

9	Information Disclosure Statement (IDS) Form (SB08)	IDS.PDF	218940 2080e5f12c8fd85687a8e8b76d0ae334179faf7d	no	3

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10	Foreign Reference	FR-1-DE3639026A11.pdf	1382612 453f7b2dc5d49568f1c04abb6ae3601fd7dfbd02	no	14

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11	Foreign Reference	FR-2-DE4209936.pdf	1097797 c76f3647a93ffe8e55ffbfb31a5f8013267f06ca	no	23

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Information:

12	Foreign Reference	FR-3-EP0587443A3.pdf	74778 8c47d26ba8ec7c1c833ac4e581766ac10dfc6d74	no	2

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13	Foreign Reference	FR-4-EP0684585A3.PDF	49935 55baec5b4e4678f42ac27d62347fdcf4b513f7dc	no	1
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14	Foreign Reference	FR-5-EP0780800A3.PDF	44937 64f9632e7bb66ca6af4df5688ebb5465f19e0ca9	no	1
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15	Non Patent Literature	NPL-1-Sloan.pdf	283793 d5b7cb11a372c2e48aa5b1e81baf611538bf5fbf	no	4
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16	Non Patent Literature	NPL-2-Foley.pdf	1051284 60b9dae12487b40afc3d43b10931d3c855a1493a	no	18
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17	Non Patent Literature	NPL-3-Bess-Image-Generation.pdf	593894 67377a3cd8d3395d5870a51178ac7c0f51b0ed55	no	10
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18	Non Patent Literature	NPL-4-Leclerc-SRI-Terra-vision.pdf	934309 8f6ecccc955dba1a5a451344dbed9fc2d4292a43	no	20
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19	Non Patent Literature	NPL-5-Koller.pdf	590364 dd588da5aae46d7ede2e48813375a77342577a17	no	7
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20	Non Patent Literature	NPL-6-Sauter.pdf	202654 83a7ccb6e28b23f859bf5e6e3a101e284f3d06d3	no	4
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21	Non Patent Literature	NPL-7-Grueneis.pdf	67341 e1688a4cb91c21ad4e9d8bf6bb40797b0bc50202	no	1
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22	Non Patent Literature	NPL-8-TVision.pdf	582775 5c36335639fa4760cca1b3956c3901e103232232	no	14
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23	Non Patent Literature	NPL-9-Mayer-Dec.pdf	7066448 9a83e335f3ede0afa8e879584778994fa2bdbb9a	no	3
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24	Non Patent Literature	NPL-10-Fuller-Magic-Overview.pdf	534154 623ddfaf6446cb05a52803e03d92201a2af4eb0a	no	14
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25	Non Patent Literature	NPL-11-Leclerc-Technical-Note.pdf	88649 611d80bbcd7c842812bb14a0208de70c7cec41c1	no	18
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26	Non Patent Literature	NPL-12-Tierney-LBL-Report.pdf	108251 f2c00ce8eb5cecb2b66abdf75c2a133253e2e86b	no	12
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27	Non Patent Literature	NPL-13-Tierney-Proc-ACM-Multimedia.pdf	86358 76f848116b41397c01512a27f8042d54c9fcf6cd	no	11
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Information:					
28	Non Patent Literature	NPL-14-Tierney-Proc-Supercomputing.pdf	98857 e82ed33c68c55135baf13a7b8e46248450aecb64	no	10
Warnings:					
Information:					
29	Non Patent Literature	NPL-15-Tierney-System-Issues.pdf	76718 d5a54cd46a0bf40737dc0443b2f9e48770ab1f05	no	15
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30	Non Patent Literature	NPL-16-Leclerc-1994-magic-paper.pdf	526485 864a71120ee432dfed759bef3a778b0992956d76	no	22
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31	Non Patent Literature	NPL-17-Leclerc-magic-final-report.pdf	104927 a0ddc3a8bc5fc61611dc0c73356f1f54071cbb49	no	14
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32	Non Patent Literature	NPL-18-FULLER.PDF	1401073 b5717851a1e2d21c61fc54725d0be8ed2bee7b64	no	11
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34	Non Patent Literature	NPL-20-Lau-Deposition.pdf	727233 9f9917a16017b897ac4848b7721b0500a7a8966d	no	17
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35	Preliminary Amendment	Prelim-Amendment.pdf	171017 7fc63ebaf22a7430445eb632d579c85f9efeae28	no	25
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36	Fee Worksheet (SB06)	fee-info.pdf	36601 76da3b5e528deb244015d1e2c4d5f1958816932c	no	2
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			Total Files Size (in bytes):	25155071	

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

AMENDMENTS TO THE SPECIFICATION

Please replace the Abstract with the following amended Abstract:

A method and device for the pictorial representation of space-related data, for example, geographical data of the earth. Such methods are used for [[visualising]] visualizing topographical or meteorological data in the form of weather maps or weather forecast films. Further fields of application are found in tourism, in traffic control, in navigation aids and also in studio technology. The space-related data, for example topography, actual cloud distribution, configurations of roads, rivers or frontiers, satellite images, actual temperatures, historical views, CAD-models, actual camera shots, are called up, stored or generated in a spatially distributed fashion. For a screen representation of a view of the object according to a field of view of a virtual observer, the required data are called up and shown only in the resolution required for each individual section of the image. The sub-division of the image into sections with different spatial resolutions is preferably effected according to the method of a binary or quadrant tree.

Please replace the paragraph beginning at column 1, line 9 with the following amended paragraph:

The invention relates to a method and a device for pictorial representation of space-related data, particularly geographical data of flat or physical objects. Such methods are used for example for [[visualising]] visualizing topographic or meteorological data in the form of weather maps or weather forecast films. Further fields of application arise from tourism, in traffic control, as navigation aids and in studio technology.

Please replace the paragraph beginning at column 1, line 16 with the following amended paragraph:

Representations of geographical information are generated according to prior art by using a so-called paintbox. The latter generates from given geographical information maps of a desired area, which are then selectably altered, and for example can be [[coloured or emphasised]] colored or emphasized according to states, or even represented in an altered projection.

Please replace the paragraph beginning at column 1, line 22 with the following amended paragraph:

Another system for generating views of a topography is found in [[the]] known flight [simulator] *simulators*. In this case, starting from a fictitious observation point from the cockpit of an aircraft, a view of the surroundings is generated.

Please replace the paragraph beginning at column 1, line 27 with the following amended paragraph:

Electronic maps, such as are marketed today on CD-ROM memories, or navigation systems in terrestrial vehicles, likewise generate from [[a]] fixed databases a diagrammatic [[vies]] view of the geography of a desired area. These systems however do not have the capacity for representing various views of the area, but are restricted to mapping topographical features such as the configuration of roads, railway lines or rivers.

Please replace the paragraph beginning at column 1, line 35 with the following amended paragraph:

All the [names] *named* methods and devices for [[visualising]] visualizing geographical data [[utilise]] utilize fixed data sets in order to generate the desired images. The resolution of the representation is therefore limited to the resolution of the data sets stored in a memory unit. Further, only those space-related data can be observed which are provided in the respective data bank. Thus it is not for example possible to provide representations which have been generated on the basis of electronically stored maps in navigation systems with the actual cloud distribution over this area. On the other hand, flight simulators, due to the limited availability of memory space, are limited to representing narrowly defined areas with a pre-fixed resolution.

Please replace the paragraph beginning at column 1, line 63 with the following amended paragraph:

The object of the present invention is to make available a method and a device for representing space-related data which [[enables]] enable the data to be represented in any pre-selected image resolution in the way in which the object [has] *would have* been seen by an observer with a selectable location and selectable direction of view. A further object of the invention is to keep the [outlay] *effort required* for generating an image so low that the image

generation takes place so rapidly that upon alteration of the location and/or of the direction of view of the observer, the impression of [[continuos]] continuous movement above the object arises.

Please replace the paragraph beginning at column 2, line 7 with the following amended paragraph:

[[This object is]] These objects are achieved by the method according to the invention in the preamble in conjunction with the [[characterising]] characterizing features of claim 1, and by the corresponding device.

Please replace the paragraph beginning at column 2, line 10 with the following amended paragraph:

In the method according to the invention the space-related data are called up, stored and/or generated in spatially distributed data sources. These data sources include for example data memories and/or other data sources which call up and/or generate space-related data. The portion of the object to be observed, the field of view, is determined from the selected location and the selected direction of view of the observer. Then a first data set, which has a coarse spatial resolution, is called up from at least one of the spatially distributed data sources, transmitted and centrally stored, and the field of view is shown. If the resolution of the representation is below the desired image resolution, the field of view is divided into sections and an investigation is undertaken for each individual section to see whether the data within the section are sufficient for a representation with the desired image resolution. If this is not the case for one of the sections, further data with a finer resolution are called up, transmitted and centrally stored from at least one of the spatially distributed data sources, and the section is shown with the new data. In turn [an investigation is carried out into] *a check for* sufficient image resolution and possibly a further sub-division of the tested section [is carried] [[out]] into further partial sections *is performed* as described above. If the entire representation has the desired image resolution or if in the spatially distributed data sources no further data of a higher resolution are present, then the method is terminated.

Please replace the paragraph beginning at column 2, line 36 with the following amended paragraph:

The device according to the invention for carrying out this method accordingly comprises a display unit and an input unit for the location and the direction of view of the observer. The device according to the invention further has a plurality of spatially distributed data sources, a central data memory, and a data transmission network between these and [the] *an* evaluation unit, in order to determine the representation of the data on the display unit from the centrally stored data.

Please replace the paragraph beginning at column 2, line 66 with the following amended paragraph:

The method according to the invention leads to a situation in which the data for the field of view to be shown are called up from the spatially distributed data sources only in the accuracy necessary for representation of the field of view with the desired image resolution, i.e. for example with high spatial resolution for close areas of the field of view or in low spatial resolution in a view to the horizon of a spherical object. The [[number of data]] amount of data necessary for representation of the field of view and thus to be stored centrally is in principle determined by the image resolution selected and is thus substantially constant for each image. This applies for example independently of whether the observer is at a great distance from the object or directly beside it and whether the observer is looking frontally on to the object or in the direction of the horizon. Therefore, the [outlay] *effort required* for data transmission for representing the various fields of view is to a large extent constant and restricted.

Please replace the paragraph beginning at column 3, line 16 with the following amended paragraph:

Furthermore, by means of the [[number, reduced to a minimum, of data]] amount of data to be centrally stored being reduced to a minimum as a result of the method according to the invention, the memory requirement and computer time for generating the pictorial representation is greatly reduced, so that an extremely rapid image build-up becomes possible.

Please replace the paragraph beginning at column 3, line 40 with the following amended paragraph:

Thus the observer is not limited as [[regards]] to his travelling speed and yet it is ensured that an image is always shown.

Please replace the paragraph beginning at column 3, line 42 with the following amended paragraph:

It is particularly advantageous if the same [[number]] amount of data, i.e. data with the same uniform resolution, are basically [[also]] always called up for a section. In this way, [[Due]] due to the division and thus reduction in size of the sections during the method according to the invention, [[in this way]] continuous refinement of the data during the course of the method according to the invention is achieved.

Please replace the paragraph beginning at column 4, line 10 with the following amended paragraph:

Particularly suitable as objects are heavenly bodies such as the planets of the solar system, whose topography can be represented. Further space-related data of such objects include among other things meteorological or geological information, for example cloud distributions, political, economic and social data and in particular [[colour]] color information relating to the appearance of the heavenly bodies, as obtained for example for the earth from satellite images and for other planets, from images from space probes.

Please replace the paragraph beginning at column 4, line 46 with the following amended paragraph:

The data are now displayed on the background of this grid. Particularly simple is the display of height information by the application of various [[colours]] colors ([[colour]] color vertices). Satellite images or information on cloud formations can also be laid over this grid ([[texturising]] texturizing). If the grid is not equidistant but applied with different sizes of grid squares, (adaptive grids) then it is possible [hetter] to [resolve and] display specific areas [such], *like,* for example, areas with intense height alterations *with better resolution*.

Please replace the paragraph beginning at column 4, line 65 with the following amended paragraph:

In principle, the location and the direction of view of the observer is not limited. Consequently the observer can move from a view with extremely limited resolution, e.g. the earth from space, to a view of individual atoms. The range of spatial resolutions covers many orders of magnitude. In order to enable any resolutions [[also with]] while also using evaluating devices which operate internally with a limited numerical precision, for example with computers

with an address space limited to 32 bits and/or floating-point view limited to 32 bits for numbers, after an alteration in the location and of the angle of view of the observer, the data are converted to a new co-ordinate system with a new co-ordinate origin. During a continuous movement of the observer therefore the co-ordinates of the data are constantly subjected to co-ordinate transformation.

Please replace the paragraph beginning at column 5, line 39 with the following amended paragraph:

Embodiments of the method according to the invention and of the device according to the invention are given by way of example in the following:

FIG. 1: a structure of a device according to the invention;

FIG. 2: a device according to the invention;

FIG. 3: [[a diagram of the sub-division of the field of view in two sections according to the model of a quadrant tree]] the categorization of the field of view into different detail levels;

FIG. 4: [[a diagram of an adaptive sub-division of the field of view into a binary or quadrant structure]] a diagram of the sub-division of the field of view in two sections according to the model of a quadrant tree;

FIG. 5: [[a diagram of the sub-division of the field of view into sections according to the model of an octant tree]] a diagram of an adaptive sub-division of the field of view into a binary or quadrant structure;

FIG. 6: [[the interconnection of individual data sections by transverse references]] a diagram of the sub-division of the field of view into sections according to the model of an octant tree;

FIG. 7: [[the categorisation of the field of view into different detail levels]] the interconnection of individual data sections by transverse references;

FIG. 8: a cartographic view of a cloud distribution on the earth;

FIG. 9: a view of a cloud distribution on the earth as a globe;

FIG. 10: a view of the earth as a globe with cloud distribution;

FIG. 11: a view of a portion of the earth with temperature indicator tables.

Please replace the paragraph beginning at column 5, line 62 with the following amended paragraph:

FIG. 1 shows the construction of a device according to the invention for displaying geographically related data of the earth. The device comprises a plurality of spatially distributed data sources 4, a data transmission network, a plurality of devices 1, 2 and 3 as central memories[[,]] and devices for determining the display of the centrally stored space-related data (evaluation units), and a plurality of display [[unit]] units 5. This device according to the invention makes it possible for a plurality of evaluation units 1, 2 and 3 [[simultaneously]] together to access the common spatially distributed data sources 4.

Please replace the paragraph beginning at column 6, line 14 with the following amended paragraph:

The nodes are in turn sub-divided into primary nodes 1, secondary nodes 2, and tertiary nodes 3. In this case a primary node is connected both to the interchange network 7 and also via the conduits 6 directly to the spatially distributed data sources and by the conduit 8 directly with the display unit 5. The secondary node [[8]] 2 is connected only with the interchange network 7 and directly via the conduits 8 with the display unit 5. The tertiary node 3 has only one connection to the display unit 5 and to the interchange network 7.

Please replace the paragraph beginning at column 6, line 24 with the following amended paragraph:

Systems of the company Silicon Graphics (SGI Onyx) were used as a node computer. This computer is capable of displaying more than 5[,]00,000 [[texturised]] texturized triangles per second and consequently is suitable for rapid picture build-up. It operates with floating-point views with a 32 bit representation. As this accuracy in the present example is insufficient for example to follow a movement of an observer from space continuously down to a [[centimetre]] centimeter resolution on the earth, the co-ordinates of the data during such a movement were continuously converted to a new co-ordinate system with a coordinate origin located in the vicinity of the observer.